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STATISTICAL BULLETIN
Metropolitan Life Insurance Co.

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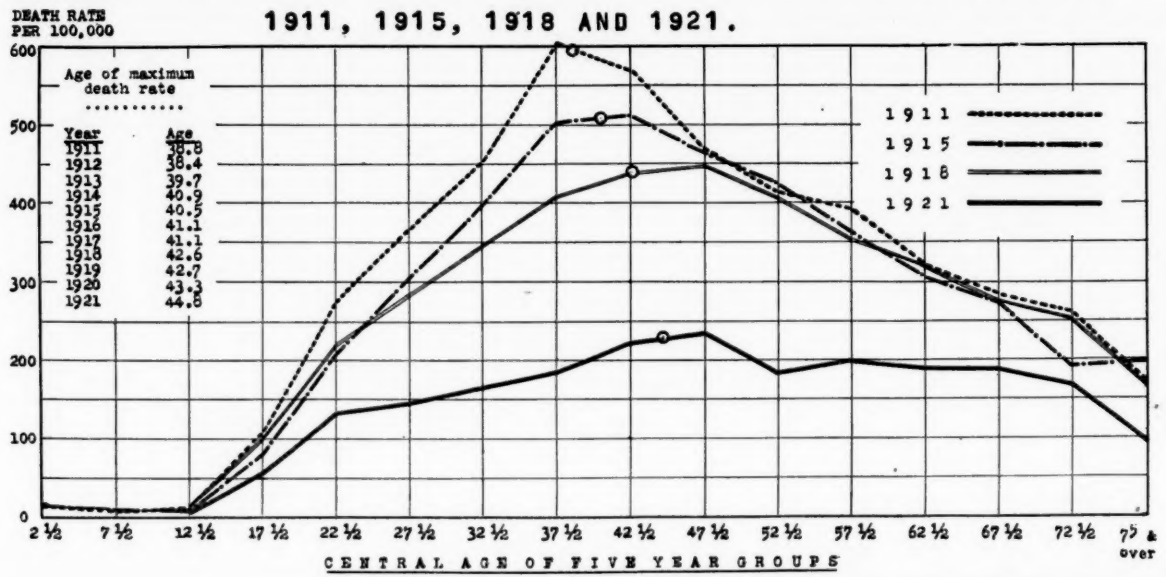
RECENT CHANGES IN AGE-TYPE OF TUBERCULOSIS.

Several years ago, Dr. John Brownlee in a very important paper* suggested that pulmonary tuberculosis was not one distinct disease, but a mixture of three allied diseases—the first, a type chiefly affecting youth, the second, affecting, for the most part, persons in middle life; and the third, a type attacking persons in old age. Dr. Brownlee reasoned further that if pulmonary phthisis were not a single disease, but rather a group of diseases, it would come into line with typhoid fever and bacillary dysentery, both of which are now known to consist of groups of diseases of which the causal organisms are closely related, possessing similar properties and producing fevers which run almost the same course. Possibly future research might even disclose different strains of the infecting organisms, each responsible for a type of the disease. Important consequences with respect to the treatment of tuberculosis, especially in vaccine and serum treatment, would follow if his conclusions were found to be justified.

Much evidence against Brownlee's hypothesis has accumulated in the past few years, and nothing, to our knowledge, has appeared to substantiate it. If there were fundamental stability in the age-types of pulmonary tuberculosis, as the author suggests, no rapid changes could be expected within a decade in type-forms of the disease in populations where only changes in environmental and hygienic circumstances had taken place. The evidence at hand for white male wage-earners insured in the Industrial Department of the Metropolitan Life Insurance Company during the past decade shows definitely that the type of age incidence of pulmonary tuber-

*"An Investigation into the Epidemiology of Phthisis in Great Britain and Ireland," Special Report Series 18, National Health Insurance, Medical Research Committee, 1918. By Dr. John Brownlee, Director of the Statistical Department.

DEATH RATES PER 100,000 FROM TUBERCULOSIS OF THE LUNGS AT SPECIFIED AGE PERIODS. WHITE MALES IN INDUSTRIAL DEPARTMENT, METROPOLITAN LIFE INSURANCE COMPANY. 1911, 1915, 1918 AND 1921.



culosis has undergone profound alteration. Not only has the maximum death rate among white male wage-earners been depressed 59 per cent. in eleven years, but the age at which this maximum death rate occurs has moved forward from 38.8 years to 44.8 years, a difference of six years. Instead of the sharply peaked curve of 1911, there was in 1921, a scarcely distinguishable peak at the age group 40 to 44 years, with a decidedly horizontal tendency of the line beyond 45 years. Such changes in the contour of the curve in so short a period as ten years would seem to disprove the assumption that tuberculosis is not one disease, but several.

The forward movement of the point of maximum mortality has definite social significance. In 1911, the maximum death rate occurred at age 38.8 years; by 1915, it had advanced to 40.5 years; in 1918, it was located at 42.6 years and in 1921 at 44.8 years. This is an advance of about one-half year of age for each calendar year. At the age ranges where the responsibility of males for the care of families of young children is greatest, the total number of deaths has been cut more than one-half. Further, the age of maximum burden has been advanced in life to a point where the father has fewer young children incapable of self-support. There is, therefore, a lessening of the strain upon public and private relief agencies, and a certainty that many thousands of children have today the benefit of home care which they would not have had if mortality conditions of ten years ago were in current effect.

The most encouraging fact in the vital statistics of these insured wage-earners today is that the changes in the age contour of the tuberculosis curve are continuing. There seems to be no immediate check in this wholesome tendency of tuberculosis to become less and less a menace to the American family. Those measures which have in one decade succeeded in saving so many thousands of lives in the families of the American and Canadian wage-working population, should be continued with redoubled vigor. The conservation force of public and private agencies should be directed at an ever-increasing fall in the death rate of a disease which makes such heavy inroads upon family welfare, and which is so readily controllable.

INCREASING VIRULENCE OF SMALLPOX IN 1922.

Reports to this office from 24 American states and from 190 cities, including all the larger ones, show that the smallpox prevailing during the first six months of this year is far more virulent than the type of disease which prevailed during the same period of 1921.

The number of cases was, to be sure, 72 per cent. less this year in 24 states combined and 74 per cent. less in 190 American cities. In these cities, however, the number of deaths during the first six months of 1922 was nearly four times the number reported in the same period of 1921. The following table shows the facts made available by the health officers and registrars of the United States:

Number of Cases and of Deaths from Smallpox in Certain Areas of the United States, First Six Months of 1922 and 1921 Compared.

Area	Cases		Deaths		Deaths Per 100 Cases	
	1922	1921	1922	1921	1922	1921
24 States.....	10,618	37,624	71	149	.7	.4
190 Cities.....	4,898	18,686	268	68	5.5	.4

The data for the cities come much closer to a description of the actual state of facts regarding the virulence of the disease. Several of the States which had cities with epidemics of virulent smallpox were unable to report data for the first six months of this year. In the group of 190 United States cities, among 4,898 cases, 268 deaths were reported this year, or a case-fatality rate of nearly 6 per cent. In the same cities during 1921, the case-fatality rate of smallpox was only .4 per cent. The 268 deaths were reported chiefly from Shawnee, Oklahoma (12), Mobile, Alabama (11), Tucson, Arizona (26), Denver, Colorado (81), Chicago, Illinois, (15), Kansas City, Kansas (30), and Kansas City, Missouri (61).

The Denver and Kansas City records show that in any locality at the present time we may expect an outbreak of smallpox which can claim as high as one death in every two or three cases. No American city can be assured of safety in view of the record this year in cities which, prior to 1922, had not had experience with the virulent type of the disease. There is little comfort in the reduced number of *cases* this year. We have in our midst a smallpox which, if allowed to reach populations not yet adequately protected by vaccination, may result in an enormous loss of life, the complete paralysis of business enterprise, and the disability and permanent disfigurement of many thousands of our fellow citizens.

HEART DISEASE AMONG CHILDREN.

We are very likely to under-estimate the gravity of cardiac disease among children, both from the standpoint of morbidity and mortality. The sickness rate and the death rate are so much higher among adults that attention is naturally focused upon the older ages. But if we measure the importance of heart disease by comparing its frequency among children with that of those other diseases which are generally considered to be the chief causes of child mortality, we find that heart diseases rank high. The fact will soon be generally recognized that heart disease is a problem for the pediatrician and for the school authorities as well as for the cardiac specialist.

In school surveys, it has been found that at least one per cent. of the children in elementary school grades have serious cardiac affections. In New York City, it is estimated that there are 20,000 or more school children suffering from definite cardiac defects. In each of the larger cities of the country, the work of school medical inspectors has disclosed large numbers of cardiac children, the ratio to the total children examined varying but little from two per cent. Among the 20,000,000 school children in the United States, between five and thirteen years of age, there must be as many as 200,000 cardiacs of various degrees of impairment whose condition requires systematic, skilled medical supervision. There is, indeed, a great opportunity for checking heart disease mortality in later life through the discovery and relief of these children.

Much stress is at the present time being laid upon the *prevention* of heart disease, and efforts along this line may well be directed with due consideration of the fact that while cardiac diseases usually *cause death* in later life, they are often *acquired* during childhood. In the case of the New York school children it was brought out that in large numbers of the cases there were significant histories of tonsilitis, rheumatism, diphtheria and dental disease, and that measles, pneumonia, whooping cough, scarlet fever and chorea had also been more or less frequently present as antecedents. It is known also that in many of these cases, the cardiac impairment followed closely upon the attack of infectious disease. It is thus obvious that intelligent care of children who have had infectious diseases is very important in connection with the prevention of heart disease. The early diagnosis of rheumatism is especially

important; so is the increased practice of tonsilectomy; so, also, is better care of the teeth.

From the standpoint of mortality alone, heart disease is a very important item among children. It is interesting to compare the loss of life due to various cardiac impairments among wage-earners' children, with that due to maladies generally recognized as "children's diseases." At ages one to four, for example, heart disease causes approximately one-third as many deaths as does scarlet fever or one-quarter as many as whooping cough. At ages five to nine these organic heart troubles cause more deaths than do any of the so-called children's diseases with the single exception of diphtheria. In this age group, heart disease has a much higher death rate than has pulmonary tuberculosis. In the latest period of childhood, 10 to 14 years, the mortality from cardiac conditions is heavier than that from the four principal diseases of childhood combined. Tuberculosis is then the only condition which leads heart disease as a cause of death.

Cardiac impairments rank high as "children's diseases." We must not allow their relatively higher death rates in middle adult life and in old age to obscure their importance in childhood.

FAVORABLE OUTLOOK FOR LOWER PUERPERAL MORTALITY RATE IN 1922.

The death rate from diseases and conditions related to childbearing has been considerably better during the first six months of this year than during the corresponding period of last year. There was a decline of 3.6 per cent. in the death rate. This is especially encouraging in view of the very unsatisfactory conditions that have prevailed during the last four years.

The improvement for this year appears to be limited to puerperal septicemia, which declined 21.4 per cent. in the rate. The mortality from this disease tends to rise and fall in fairly definite four and five year cycles and, on that account, a decline was expected this year. The periodic fluctuations in the death rate for this disease are so marked that some authorities have ventured to associate these changes with the rise and fall of scarlet fever and with cyclical variations in the infectivity and virulence of the *streptococci*. The year 1921 was apparently the peak year of the upward swing which began in 1919. This year, and possibly 1923, may show lower death rates, characteristic of the descent of the curve of mortality of puerperal septicemia. It is disconcerting to find that the successive waves do

not show any appreciable diminution in the death toll, certainly nothing commensurate with the increasing care which is being given by public and private health agencies to women in confinement. There is still something materially lacking either in the extent or in the type of care provided for parturient women. This is a serious deficiency because even the best prenatal work may go for naught if confinement care is inadequate.

Puerperal albuminuria and convulsions stay at about the same level as for the first six months of 1921; this, also, in spite of the increasing effort of public health agencies to reach women during pregnancy.

The rates for the accidents of pregnancy and of labor have increased, but the showing is fairly satisfactory in view of the influenza epidemic which prevailed in the first few months of 1922. It is encouraging to note, that for these accidents, the mortality rate is returning to about what it was prior to the pandemic period of 1918. During the seven years preceding the influenza outbreak, the death rate among insured women from these two conditions was declining slightly. The situation this year would suggest that a continuation of this downward tendency may be looked for in the next few years, barring, of course, a serious return of influenzal disease, which interferes seriously with pregnancy and with the normal mechanism of labor.

THE LOWER DEATH RATES IN 1920 AFTER MIDDLE LIFE.

In our May BULLETIN, we offered a comparison of the death rates in the Original Registration States for the years 1901, 1910 and 1920, and expressed our satisfaction with the fact that, in 1920, there had been a reduction in the mortality rates after fifty years of age over the figures for 1910, whereas there had been an increase at these ages in the decade 1900-1910. This favorable tendency, we pointed out, was likely to continue under the much improved conditions of life that now prevail.

One of our correspondents who is particularly well informed on the problems of hygiene in middle life has suggested that we have perhaps overstressed the importance of the 1920 figures. He thinks that the favorable experience of that year may have resulted from the effect of the influenza epidemic during 1918 and 1919. In those years, he thinks there were many deaths of organically impaired persons, who, under normal conditions, would have died in 1920 or in subsequent years. In this way, the 1920 figures may have been

reduced only temporarily without really indicating the underlying tendency of the decade.

There are, however, a number of interesting points that militate against this contention. In the first place, the favorable mortality of 1920 at the ages of middle life is not a temporary condition but has continued and actually improved in the year 1921. The second point is that the influenza mortality of 1918 and 1919 was especially serious at the younger ages of adult life and did not affect the older ages in any marked degree. Thus, in the experience of the Metropolitan Life Insurance Company, Industrial Department, there was an extra mortality of 9.8 per 1,000 at the ages 25 to 34 in the year 1918 over the year 1917, but in the age period 45 to 54, the increase was only .58 per 1,000 and in the age period 55 to 64, there was an actual decrease of 1.2 deaths per 1,000 living. We can hardly, therefore, ascribe the improvement after the age of 50 which was shown in 1920 to the destructive action of the influenza in 1918 and 1919, since there was comparatively little or no excess mortality at these older ages in the year of the epidemic. The following table shows what actually happened in the years immediately preceding and following the epidemic at the age periods from 45 to 74 years:

Death Rates per 1,000 from All Causes of Death, at Specified Age Divisions beyond 45 years, Metropolitan Life Insurance Company, Industrial Department.

Age Period	1921	1920	1919	1918	1917
45 to 54	13.40	14.96	16.04	20.20	19.62
55 to 64	26.91	28.89	29.10	34.61	35.83
65 to 74	59.68	64.96	63.54	72.45	76.40

Caution is still necessary in drawing conclusions from the above figures. There is much to learn about the phenomenon which attracted so much attention shortly after the 1910 Census figures became available. There is ground, however, for much encouragement in the findings for 1920 and in the subsequent year. It has always been a difficult matter to explain the rising tendency in American mortality at the older ages which was observed in the preceding decade, in view of the general agreement that the conditions of life were everywhere improving among the American people. From the facts shown in the foregoing table, it would seem that this anomaly

in the mortality situation no longer exists. Barring occasional departures of the death-rates in middle and later life from the line of trend, we may expect further improvement.

HEALTH RECORD FOR JULY, 1922.

The death rate for July emphasizes the remarkably favorable health situation which has prevailed this year. The rate was 7.6 per 1,000, which, together with a similar figure for August, 1919, is the lowest ever recorded among the many millions in the Industrial Department of the Metropolitan Life Insurance Company. As compared with July, 1921, this year's rate for the month shows a decline of 4.0 per cent. The drop from the June, 1922 figure is 16.3 per cent. Despite the relatively unfavorable health situation during the early winter, due to the influenza flurry, there is still a chance that 1922 will equal the remarkable health record of 1921. The cumulative death rate for this year is now only 3.0 per cent. in excess of that in evidence for the first seven months of last year. All of the diseases of greatest numerical importance—tuberculosis, cancer, cerebral hemorrhage, organic heart disease, pneumonia and Bright's disease, show marked declines from the figures recorded for the preceding month, and the rates for the first four of the above diseases are lower, also, than were recorded in July, 1921. For all of the epidemic diseases of children, and especially diphtheria, the rates are also very low, even for this season, which is the most favorable of the year for this class of maladies. The diarrheal disease figure for July (14.1 per 100,000) is a very low summer record for this complaint.

The typhoid fever rate shows the usual July rise as compared with June. We may expect still higher rates for this disease for the next two months, due to seasonal conditions which always cause higher typhoid mortality during the late summer and early fall. The typhoid rate in July, however, was lower than that recorded for the same month of last year.

Automobile fatalities constitute the one outstanding bad spot for the month. The July figure (14.2 per 100,000) is much higher than that for July, 1921 (10.7), and is also higher than the June, 1922, figure (13.7). The automobile situation is undoubtedly going from bad to worse, and there is every reason to expect that the 1922 death rate will mark a new maximum for this cause of death.

The death rate for the general population of the large cities of the United States was 10.6 per 1,000 in July, 1922, as compared with 10.1 for the corresponding month of 1921. The figure was slightly lower than that for June, 1922. Increases, as compared with June, were recorded in the number of cases of malaria, poliomyelitis and typhoid fever; whereas, declines were registered for influenza, measles, smallpox, scarlet fever and diphtheria.

All states reporting, with the exception of Louisiana, have had fewer cases of smallpox as compared with July, 1921. In that state, 116 cases were reported during the fourth week of the month. In New Jersey, as a result of a recent decision by the State Board of Education, vaccination in the schools under the jurisdiction of the Board, is to be governed by the practice of the district in which the school is located.

Typhoid fever cases in considerable numbers were reported from Mississippi, Alabama and Kansas. A number of cases of this disease occurring in New Haven, Connecticut, since June 1st, have been traced to infected clams.

Three cases of Rocky Mountain spotted fever occurred in Wyoming, eight in Montana, and one in Colorado during the first four weeks of July.

A case of bubonic plague was reported from Santa Cruz County, California, on July 15th.

The table below displays the mortality among the Industrial policyholders for July, 1922, June, 1922, July, 1921, and for the year 1921.

METROPOLITAN LIFE INSURANCE COMPANY.

Death Rates per 100,000 for Principal Causes, Premium-paying Business in Industrial Department. (Annual Basis)

MONTHS OF JUNE AND JULY, 1922, AND OF JULY, 1921.

CAUSES OF DEATH	RATE PER 100,000 LIVES EXPOSED			
	July, 1922	June, 1922	July, 1921	Year 1921
TOTAL—ALL CAUSES	756.9	904.7	788.3	870.6
Typhoid fever	6.8	5.2	7.4	6.7
Measles	3.3	7.6	3.0	3.2
Scarlet fever	2.3	2.4	4.7	7.0
Whooping cough	2.1	2.1	3.6	3.9
Diphtheria	10.4	11.1	13.3	23.8
Influenza	3.9	10.1	2.6	8.7
Tuberculosis (all forms)	105.4	133.7	109.0	117.4
Tuberculosis of resp'y system	95.0	119.5	97.4	105.6
Cancer	64.1	72.5	69.8	71.7
Cerebral hemorrhage	49.0	62.8	52.4	62.1
Organic diseases of heart	100.0	126.9	101.3	117.4
Pneumonia (all forms)	29.3	52.1	28.9	67.8
Other respiratory diseases	10.7	11.4	9.0	14.1
Diarrhea and enteritis	14.1	11.9	21.3	14.2
Bright's disease (chronic nephritis)	59.9	73.4	59.9	68.0
Puerperal state	15.2	20.6	16 8	19.8
Suicides	7.0	8.6	7.0	7.6
Homicides	5.6	5.7	6.4	6.7
Other external causes (excluding suicides and homicides)	68.8	63.3	77.2	57.6
Traumatism by automobile	14.2	13.7	10.7	12.2
All other causes	199.1	223.3	194.5	192.9

Correspondence on the subjects discussed in these BULLETINS may be addressed to: The Editor,

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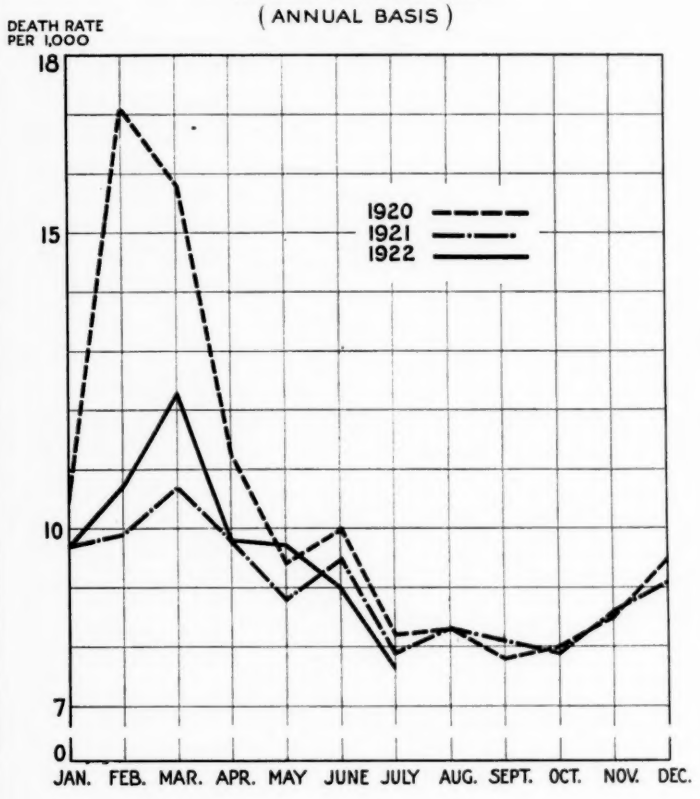
DEATHRATE *per* 1,000 IN SPECIFIED MONTHS OF 1920, 1921, 1922

METROPOLITAN LIFE INSURANCE COMPANY
INDUSTRIAL DEPARTMENT
(ANNUAL BASIS)



	1920	1921	1922
JAN.	10.4	9.7	9.7
FEB.	17.1	9.9	10.7
MAR.	15.8	10.7	12.3
APR.	11.3	9.8	9.8
MAY	9.4	8.8	9.7
JUNE	10.0	9.5	9.0

	1920	1921	1922
JULY	8.2	7.9	7.6
AUG.	8.3	8.3	
SEPT.	7.8	8.1	
OCT.	8.0	7.9	
NOV.	8.5	8.6	
DEC.	9.5	9.1	

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